

Klamath Bird Observatory's Contribution to the USFWS Western Colonial Waterbird Survey: Summary of 2011 Survey Efforts and Results

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Cover photographs: Clockwise from upper left: Great Blue Heron, Great Egret, American White Pelican, Black-crowned Night-Heron. Photos copyright Jim Livaudais, 2012.



Klamath Bird Observatory's Contribution to the USFWS Western Colonial Waterbird
Survey: Summary of 2011 Survey Efforts and Results

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Introduction

Colonial nesting waterbirds concentrate in areas of suitable nesting habitat. This aggregated spatial distribution means local environmental changes such as water fluctuation, water quality, predation, disturbance, or food availability can rapidly affect a proportionately high percentage of the population. The *North American Waterbird Conservation Plan* (NAWCP) states that 80% of waterbirds are colonial nesting species and one-third of those are at risk of serious population loss (Kushlan et al. 2002). The plan calls for a regional approach to monitoring and conservation and states that the conservation assessment of waterbird populations is dependent upon collecting more information on population size, trends, and the relative importance of specific sites.

At the regional level, the population statuses of western colonial waterbirds are not well understood and the Intermountain West Waterbird Conservation Plan, the regional step-down plan for the NAWCP, expresses the need for additional baseline information to better inform management and implement conservation (Ivey and Herziger 2006). Both Regions 1 and 8 of the U.S. Fish and Wildlife Service (USFWS) Migratory Bird Program have identified Oregon as a priority for periodic monitoring of colonial waterbird populations.

In response to these regional needs, the USFWS has coordinated the Western Colonial Waterbird Survey (Seto 2008), with implementation between 2009 and 2011 on 17 species in 11 western states. KBO has contributed to this west-wide effort by implementing inland colonial waterbird surveys within Oregon. In 2009, we documented species composition, size, and location of tree- and ground-nesting waterbird breeding colonies for Double-crested Cormorant, Great Blue Heron, Great Egret, Black-crowned Night Heron, California Gull, and Ring-billed Gull, focusing on priority survey locations in Klamath, Lake, and Harney counties (Bruce et al. 2009). In 2010 we documented species composition, size, and location of marsh-nesting waterbird breeding colonies for Eared Grebe, Western Grebe, Clark's Grebe, White-faced Ibis, Franklin's Gull, Forster's Tern, and Black Tern, focusing again in Klamath, Lake, and Harney Counties where the majority of suitable habitat exists for this group in Oregon (Hussey et al. 2011). In 2011 we expanded tree- and ground-nesting waterbird surveys statewide and included the additional species of Snowy Egret, Caspian Tern, and American White Pelican. We also documented additional colonies of marsh-nesting colonial waterbird species at select sites that were not previously surveyed.

Monitoring of colonial waterbird populations closely aligns with the goals of the Oregon Coordinated Aquatic Bird Monitoring Program (OCABMP) which is led by the Klamath Bird Observatory and supported by a network of partners. OCABMP seeks to provide more information about aquatic ecosystems and bird conservation in Oregon. OCABMP objectives include identification and coordination of existing monitoring efforts and implementation of new monitoring projects to help ascertain the status of aquatic bird populations, including colonial waterbirds.

In this report we summarize our 2011 colonial waterbird monitoring efforts. We present species composition, size, and location of each colony and number of nests and adults where possible. For a summary of our 2009 and 2010 efforts see Bruce et al. (2009) and Hussey et al. (2011), respectively.

Methods

Species

Survey focal species included nine tree- and ground-nesting colonial waterbirds: American White Pelican, Double-crested Cormorant, Great Blue Heron, Great Egret, Snowy Egret, Black-crowned Night-Heron, California Gull, Ring-billed Gull, and Caspian Tern. We also recorded marsh-nesting colonial waterbird colonies at two sites to supplement surveys done in 2010. Marsh-nesting waterbird species include Eared Grebe, Western Grebe, Clark's Grebe, White-faced Ibis, Franklin's Gull, Forster's Tern, and Black Tern.

Survey Sites

We implemented surveys at 298 sites throughout Oregon, including a few along the Columbia River in Clark County, Washington because they were in very close proximity to Oregon colonies (Figure 1, Table 1). Marsh-nesting colonial waterbird colonies were counted at Fern Ridge Reservoir, Lane County, where surveys were not done in previous years, and Goose Bay, Klamath County, where wetlands restoration is rapidly changing nesting suitability. Locations surveyed were derived before the field season from a historic list of colonial waterbird breeding sites in Oregon (Hoskins pers comm 2008), a report of waterbirds in the Klamath Basin of Oregon and California (Shuford et al. 2006), and current or historic Great Blue Heron colony locations provided by partners including Oregon Parks and Recreation Department and Portland Audubon. Additional locations with suitable habitat were opportunistically surveyed when discovered in the field. Some sites with known American White Pelican and Caspian Tern colonies were not visited by KBO because they were surveyed in 2011 by Oregon State University.

Protocol

Survey methodologies and timing followed the *Western Colonial Waterbird Survey Protocols* (USFWS 2008), which identifies several potential survey techniques based on site and colony characteristics. When possible, colony size was determined using nest counts. In accord with the protocol, we counted active nests as determined by newly added vegetation and similarity in size and shape to nests being actively tended by adults.

Flush counts were used in some instances when counting every nest was not possible or would cause excessive disturbance.

Some sites were visited multiple times to accommodate the timing of nesting due to species variation and fluctuating water levels. Focal species were counted at sites when colonies were not present as well. In addition to species counts, environmental data such as disturbance, atmospheric conditions, general habitat, and nest substrate were recorded.

Results

From 5 May to 20 August 2011, 298 sites were surveyed (Table 1) for colonial waterbird focal species. A total of 9846 adults and 2756 nests were counted. One hundred-two colonies were detected at 71 sites for a total of 5137 breeding pairs (Table 2, Table 4). Colonies were detected in 18 counties (Table 3, Table 4). Focal species distributions reflected distribution maps in *Birds of Oregon* (Marshall 2003) (Figures 2-8).

Double-crested Cormorants were well distributed throughout the survey area with the exception of the Willamette River corridor (Figure 2). They had the third highest number of breeding pairs at 747 behind the gull species (Table 3). The average size of the 14 colonies was 53 pairs. Inland colonies were small, usually well under 40 pairs with much larger colonies occurring on the coast. Bolon Island in Douglas County had 390 pairs and North Point in Coos County had 160 pairs (Table 2).

Great Blue Herons were common and well dispersed throughout the study area but densest within the Willamette River corridor and along the Columbia River and other riparian stretches of the greater Portland area (Figure 3). Great Blue Heron colonies were by far the most commonly detected colony of the focal species. Thirty-nine colonies were detected, totaling 459 breeding pairs with an average colony size of 12 pairs (Table 3). The largest colony contained 40 pairs and was located in Reed Island in the Columbia River in Clark County, Washington (Table 2).

Nearly all Great Egrets were located in south-central Oregon (Figure 4). Great Egret colonies followed the same pattern as Double-crested Cormorants with smaller sizes inland and larger sizes at the coast. The average size of the 10 inland colonies was 19 pairs but the coastal colony in Coos County numbered 115 pairs (Table 2). The second largest colony was located on private land in Harney County at 76 pairs (Table 3).

All Snowy Egrets were located in south-central Oregon (Figure 5). Abundance was very low with only 21 adults and 3 breeding pairs detected (Table 3). Individuals were detected at a few locations in Klamath County but the only nesting was found in a mixed colony on private land in Harney County with Great Blue Herons, Great Egrets, Black-crowned Night-Herons, and Double-crested Cormorants (Table 2).

Black-crowned Night-Heron colonies were primarily found in south-central Oregon although two adults were seen at Ladd Marsh Wildlife Management Area in northeastern Oregon and 12 were seen at Brookings Harbor in southwestern Oregon (Figure 6). A total

of nine colonies and 111 breeding pairs were counted with an average colony size of 12 pairs (Table 3). The largest colony was found at Warbler Pond in Harney County with 37 breeding pairs (Table 2).

Ring-billed Gulls were detected in several locations east of the Cascade Mountains (Figure 7) and had the highest number of breeding pairs of the survey focal species with 3558 adults counted and 1417 breeding pairs (Table 3). The average number of pairs in the ten colonies was 142. The largest colony occurred on an artificial nesting island at Summer Lake Wildlife Management Area with an estimated 700 pairs. The second two largest colonies occurred in Klamath and Lake Counties at 256 and 209 breeding pairs, respectively (Table 2).

California Gulls were also detected in several locations east of the Cascade Mountains (Figure 8) and were numerous with 1220 pairs (Table 3). The largest colony was on Threemile Canyon Island on the Columbia River in Morrow County with 916 pairs (Table 2). The remaining four colonies were located in Lake and Harney Counties and averaged 76 breeding pairs.

In 2011, Oregon State University (OSU) conducted American White Pelican and Caspian Tern surveys at many colonies throughout Oregon. In order to minimize disturbance to OSU research and the birds themselves, KBO only surveyed American White Pelicans and Caspian Terns at locations not already covered by OSU. American White Pelicans occurred mainly in southern Oregon although some non-breeding groups were detected at Umatilla National Wildlife Refuge in northern Oregon and at Fern Ridge Reservoir in central-western Oregon (Figure 9, Table 2). Six hundred-forty six breeding pairs were counted at five colonies with an average colony size of 129 breeding pairs (Table 3). Caspian Terns were most frequently seen in southern Oregon though some were found along the Columbia River to the north (Figure 10). The only Caspian Tern colony surveyed by KBO consisted of 48 breeding pairs and was detected on private land near flooded Malheur Lake in Harney County (Tables 2 and 3). OSU implemented Caspian Tern surveys at all artificial nesting islands created for Caspian Terns with the exception of the one at Fern Ridge Reservoir which was vacant.

Marsh-nesting colonial waterbird species (i.e. Eared Grebe, Western Grebe, Clark's Grebe, White-faced Ibis, Franklin's Gull, Forster's Tern, and Black Tern), were surveyed only at two sites not visited during the previous survey year. Twelve Eared Grebe and four Western Grebe nests were counted at Goose Bay on Upper Klamath Lake (Table 4). Breeding pair estimates at this site are conservative because difficult maneuverability, high temperatures, and the presence of gulls prohibited a thorough survey. Black Terns and Western and Clark's Grebes colonies were detected at Fern Ridge Reservoir in Lane County (Hussey and Stephens 2012). Twenty-five Black Tern breeding pairs were counted. *Aechmophorus* grebe breeding pairs were estimated at 74 (Table 4).

Discussion

Our 2011 surveys completed a three-year effort in conjunction with USFWS to survey colonial waterbirds in Oregon. Some weather conditions and site visits during 2011 surveys were noteworthy and are described below.

During the 2011 breeding season, hydrologic conditions in Harney County impacted timing and possibly success of colonial waterbirds. Extremely high water levels flooded great expanses of land at Malheur National Wildlife Refuge and private property adjacent to Malheur Lake. Typical nesting islands for ground-nesting species such as gulls, Caspian Terns, and American White Pelicans were flooded. In some instances these birds attempted to nest on newly formed islands on flooded private land but initial nesting attempts failed. OSU researchers completed aerial surveys and colony visits in this area and have more detail. Water level fluctuations within and among years in the Malheur National Wildlife Refuge area are common due to the combination of variable regional snow pack and seasonal precipitation as well as a very shallow basin.

A restoration project occurring at Williamson River Delta Preserve/Goose Bay in Klamath County is noteworthy in terms of its rapid increase of nesting habitat for colonial waterbirds. This project is located at the interface of the Williamson River, Upper Klamath Lake, and Agency Lake. The Nature Conservancy purchased the land with the primary goal of restoring habitat for endangered fish. In 2009 they completed restoration of 5,500 acres of wetlands, including emergent wetland habitat suitable for colonial waterbirds (Warner 2010). The presence of empty nests and adult grebes brooding chicks during our 2010 survey provided evidence that breeding occurred. Breeding was confirmed during the 2011 revisit by the presence of incubating Western, Clark's, and Eared Grebes. This project exemplifies the speed at which avian fauna can respond to wetland restoration. In many cases, waterbirds can act as an early indicator of success for restoration projects with multiple objectives.

Fern Ridge Reservoir, managed cooperatively by the U.S. Army Corps of Engineers and Oregon Department of Fish and Wildlife in Lane County, is notable because of its value for Black Tern and *Aechmophorus* grebe populations. Although the reservoir doesn't support particularly large numbers of breeding pairs in relation to the entire population, it provides breeding habitat in a region where no other known or annually consistent colonies exist. This geographic extent provides resiliency to the population. Because of this site's importance and the innate vulnerability of local populations of colonial species, continued monitoring of marsh-nesting colonial waterbirds at Fern Ridge Reservoir is recommended (Hussey and Stephens 2012).

In summary, 2011 surveys documented species composition, size, and location of tree- and ground-nesting colonial waterbird colonies throughout Oregon and parts of the Columbia River in Washington. Through the work of KBO and various partners, we completed surveys for American White Pelican, Double-crested Cormorant, Great Blue Heron, Great Egret, Snowy Egret, Black-crowned Night-Heron, California Gull, Ring-billed Gull, and Caspian Tern colonies. Marsh-nesting colonial waterbird species were

also surveyed at select sites to supplement previous efforts. Colonial waterbird surveys completed by KBO from 2009 to 2011, as a component of the Western Colonial Waterbird Survey coordinated by USFWS, will contribute substantially to our understanding of colonial waterbird populations in the western United States. Large scale coordinated monitoring efforts are particularly important for colonial waterbirds because suitable habitat can vary annually depending on climatic variables and corresponding water levels.

Acknowledgements

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Figure 1. Sites where colonial waterbird surveys were completed in Oregon and Washington during 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

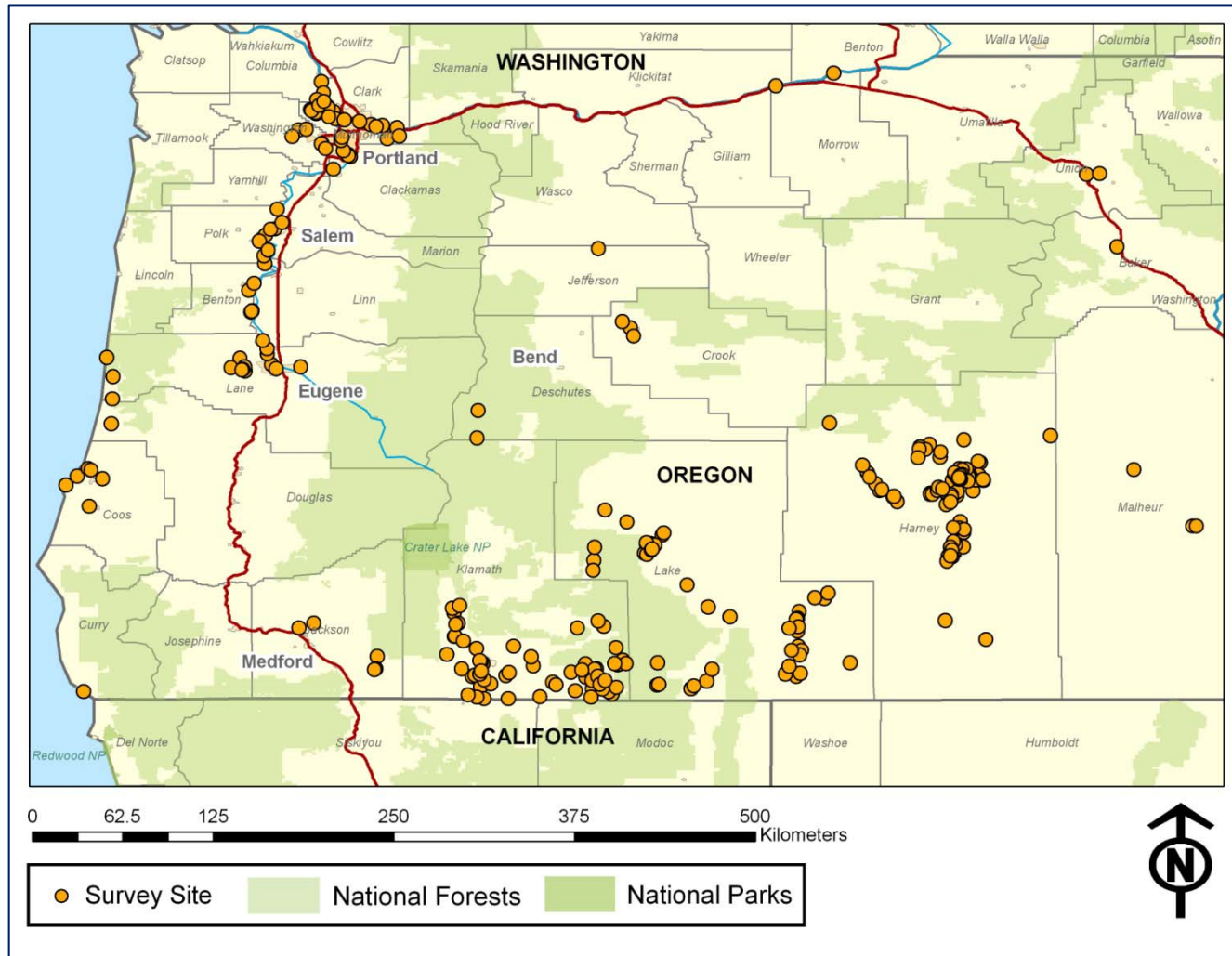


Figure 2. Survey sites where Double-crested Cormorant individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

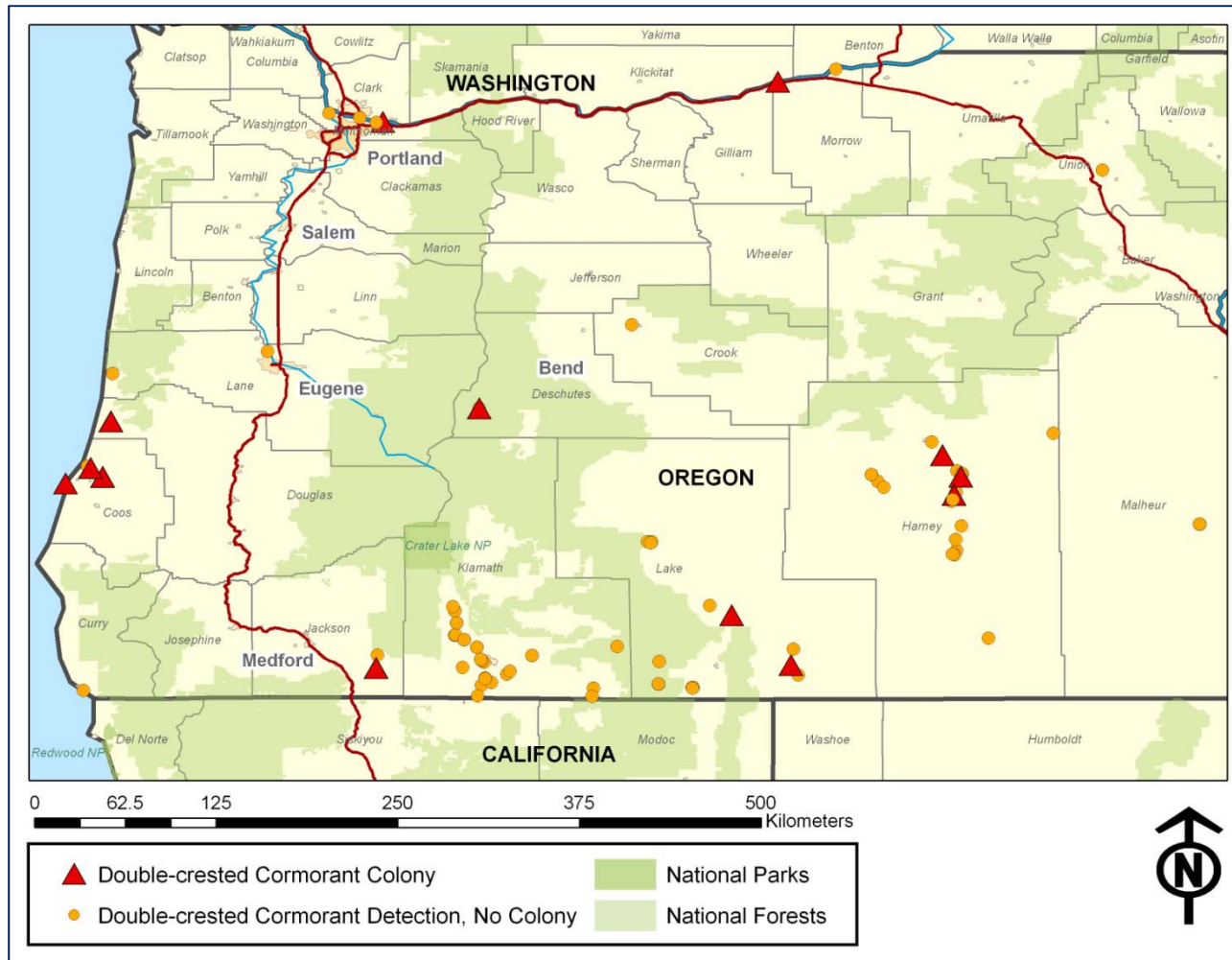


Figure 3. Survey sites where Great Blue Heron individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

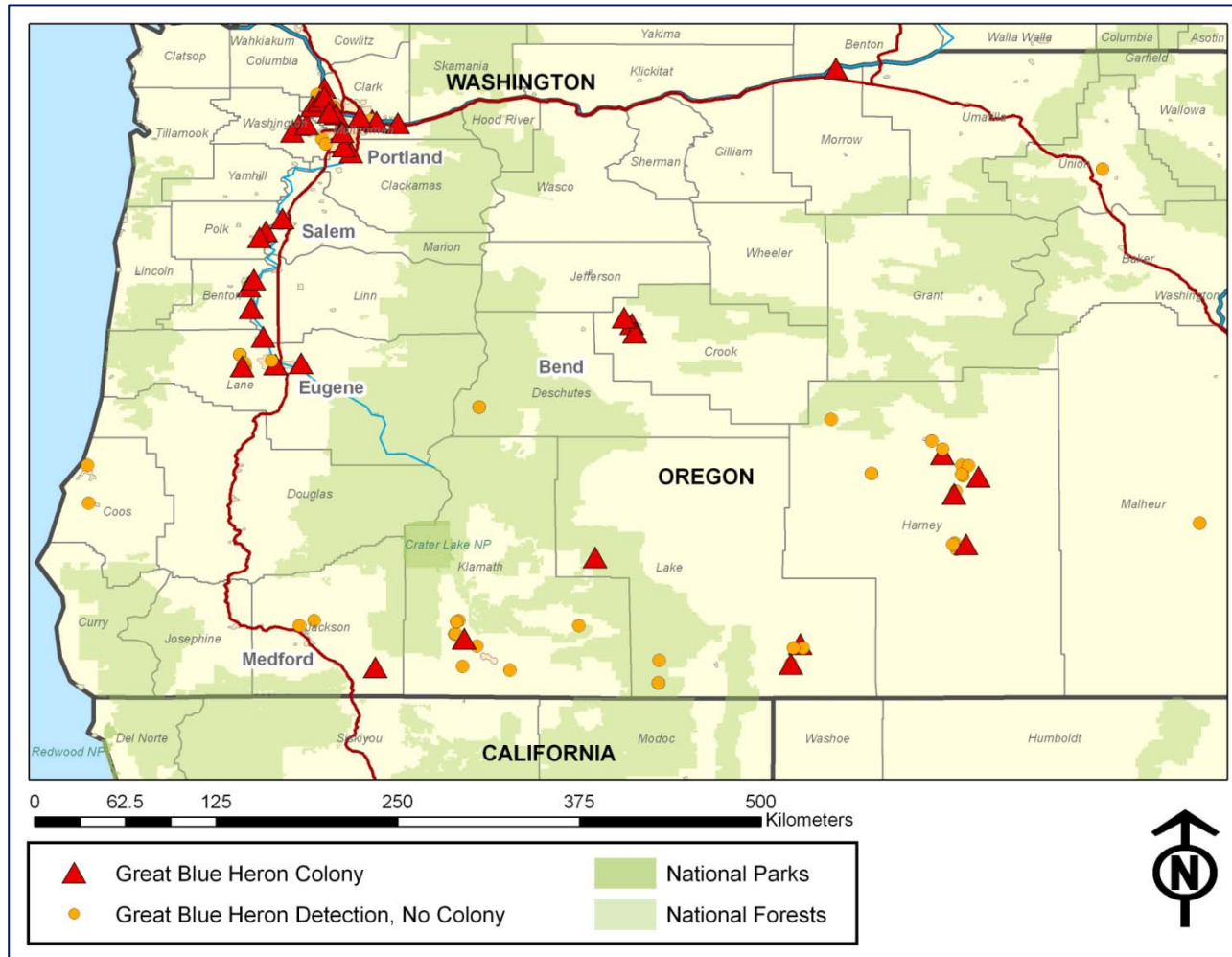


Figure 4. Survey sites where Great Egret individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

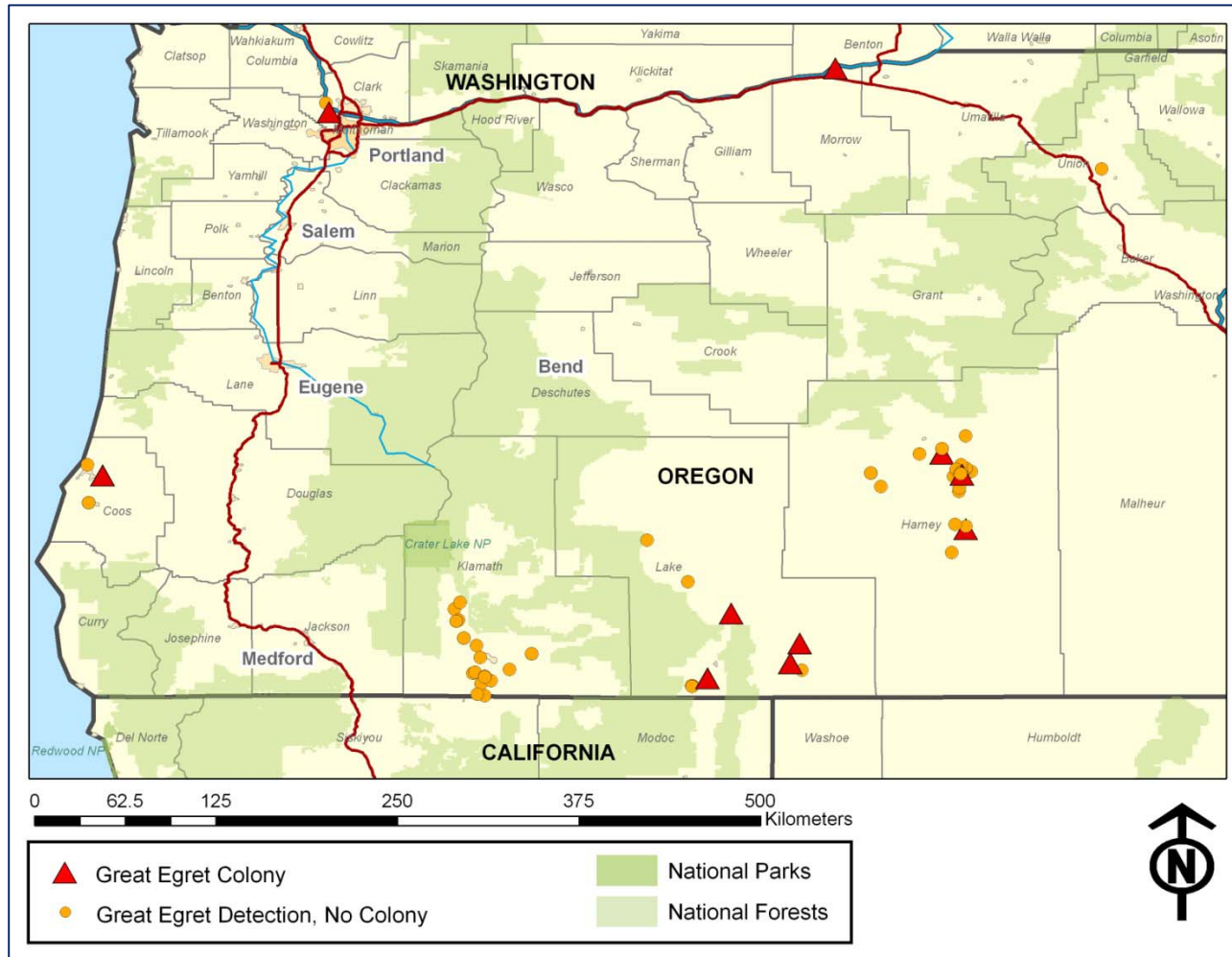


Figure 5. Survey sites where Snowy Egret individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.



Figure 6. Survey sites where Black-crowned Night-Heron individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

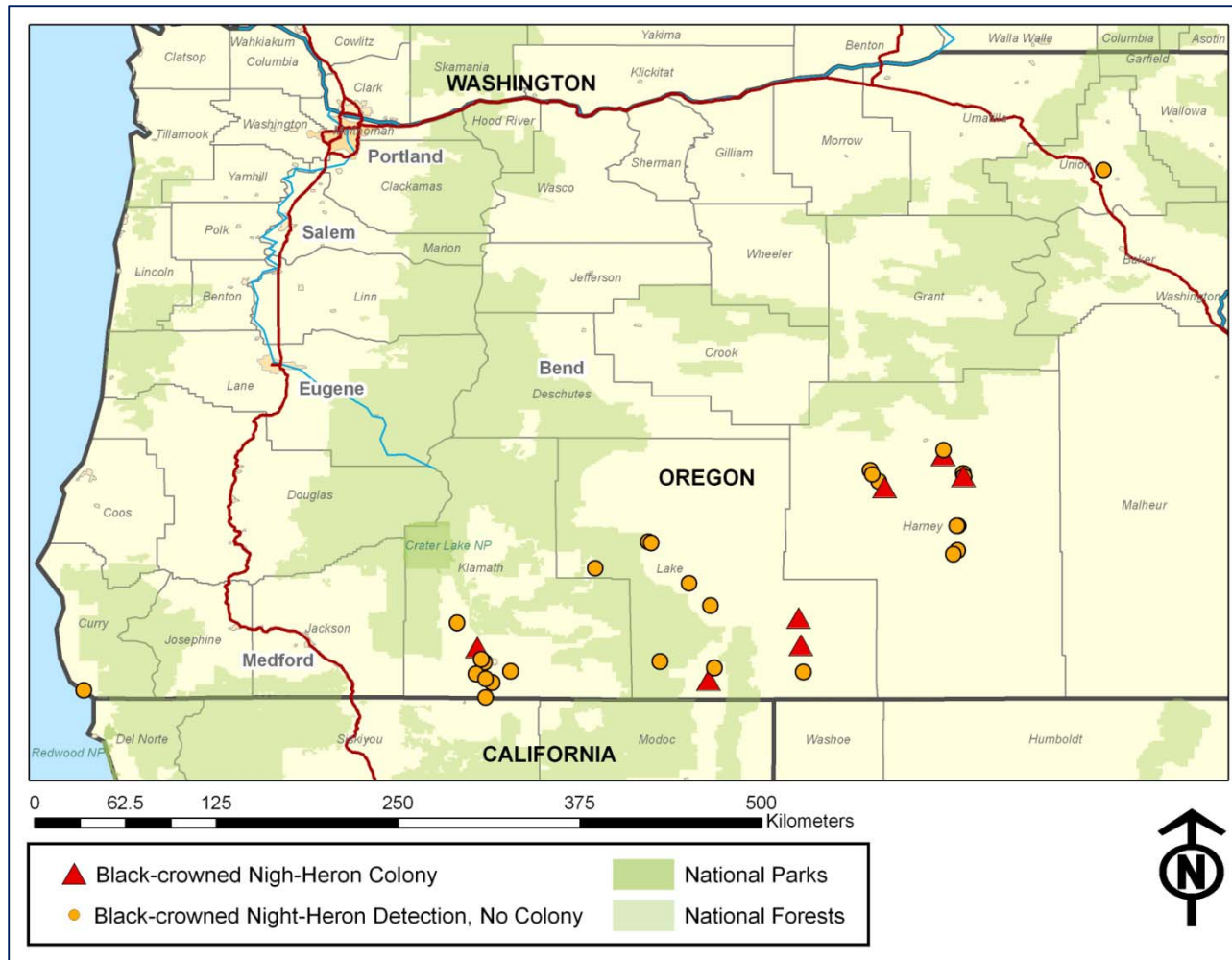


Figure 7. Survey sites where Ring-billed Gull individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

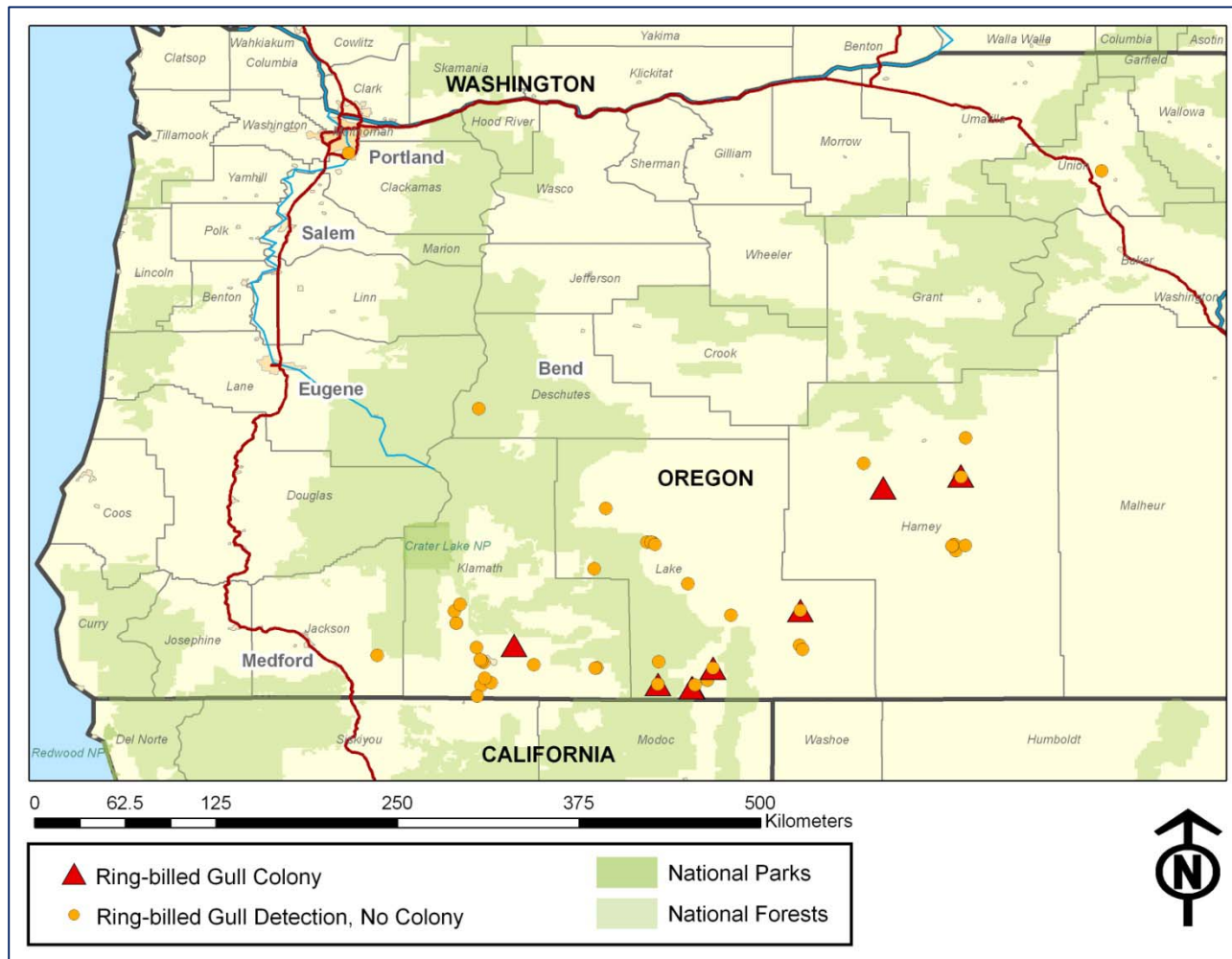


Figure 8. Survey sites where California Gull individuals or colonies were detected in 2011 by Klamath Bird Observatory, in conjunction with the Western Colonial Waterbird Survey coordinated by the U.S. Fish and Wildlife Service.

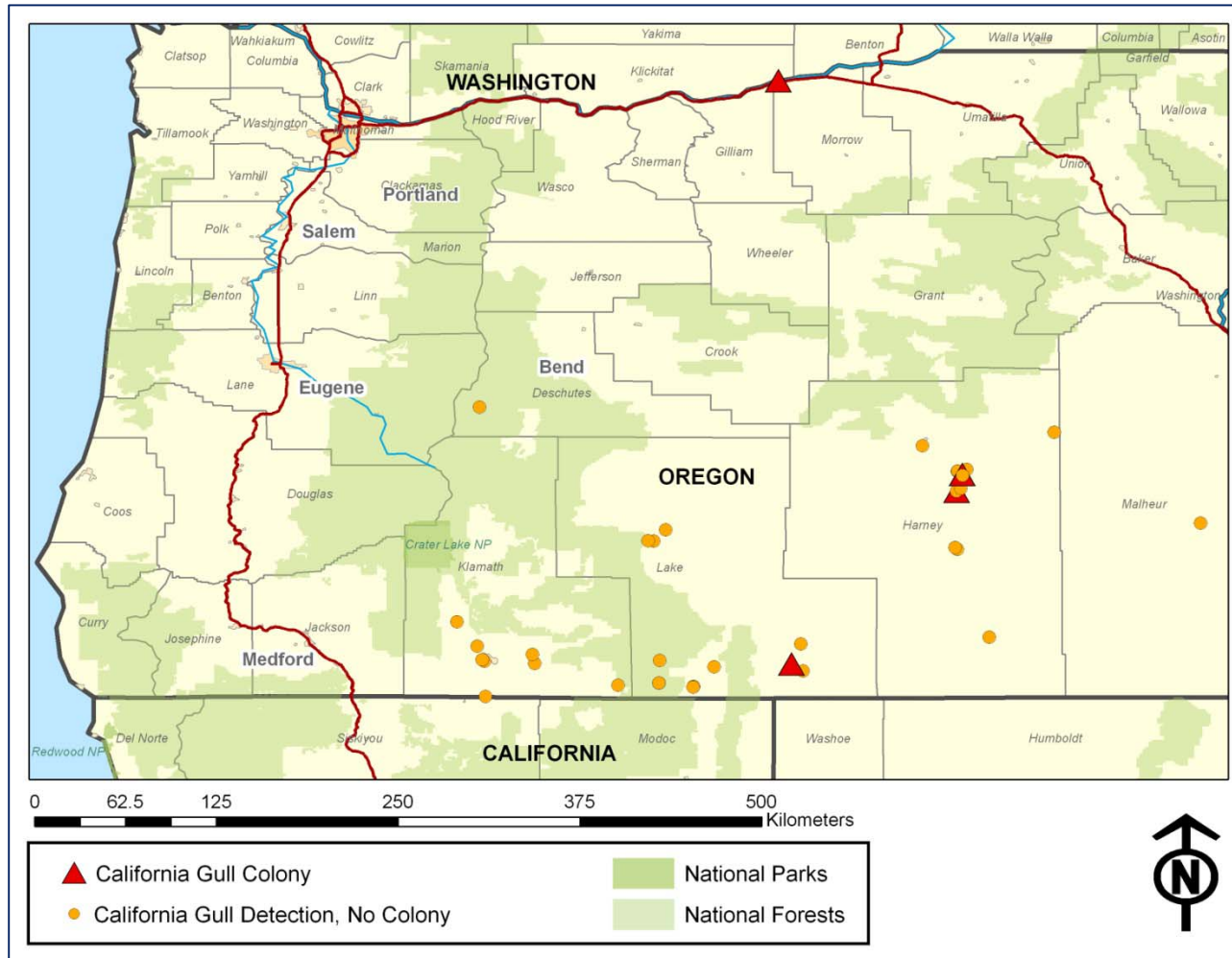


Table 1. Locations surveyed for colonial waterbirds in 2011 in Oregon and Washington, number of survey visits and presence of a colony. Geographic coordinates are in North American Datum 1983.

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Baker	Baker Sewage Lagoon	44.813670	-117.843410	1	
OR	Benton	Willamette 16	44.541770	-123.244680	1	Y
OR	Benton	Willamette River GBHE 4	44.408417	-123.229083	1	Y
OR	Benton	Willamette River GBHE 5	44.416508	-123.220908	1	
OR	Benton	Willamette River GBHE 6	44.586264	-123.212297	1	Y
OR	Benton	Willamette River GBHE 7	44.710450	-123.144133	1	
OR	Clackamas	Cedar Island	45.388689	-122.625689	1	
OR	Clackamas	Goat Island	45.372072	-122.610258	1	Y
OR	Clackamas	Mary S. Young State Park	45.379081	-122.623289	1	
OR	Clackamas	Molalla River State Park	45.296383	-122.717031	1	
OR	Clackamas	Oak Grove Neighborhood	45.410694	-122.654997	1	Y
OR	Columbia	Bachelor Island 2	45.840278	-122.791944	1	
OR	Columbia	Sauvie Island 2	45.772056	-122.776936	1	Y
OR	Columbia	Sauvie Island 4	45.730500	-122.820667	1	
OR	Coos	Coos Bay North Spit	43.386490	-124.310600	1	
OR	Coos	Coos River Hwy	43.369080	-124.151290	2	Y
OR	Coos	Jordan Cove	43.434020	-124.244120	1	
OR	Coos	North Point	43.423520	-124.224980	1	Y
OR	Coos	Sunset Bay	43.329640	-124.380620	1	Y
OR	Coos	Winter Lake 1	43.198810	-124.235600	2	
OR	Crook	Crook County 2	44.309592	-120.870333	1	Y
OR	Crook	Prineville 1	44.257158	-120.850497	1	Y
OR	Crook	Prineville 2	44.349381	-120.918667	1	Y
OR	Curry	Brookings Harbor	42.045040	-124.269910	1	
OR	Deschutes	Crane Prairie Reservoir	43.794010	-121.816020	2	Y
OR	Deschutes	Davis Lake	43.623210	-121.822050	1	
OR	Douglas	Bolon Island	43.712530	-124.099560	2	Y
OR	Douglas	Reed Island-Douglas	43.866269	-124.091503	1	
OR	Harney	9 Mile Slough East	43.469340	-118.693520	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Harney	9 Mile Slough West	43.476470	-118.706680	1	
OR	Harney	Bacus Lake	43.295420	-118.740290	1	
OR	Harney	Benson Boat Landing	43.268520	-118.837710	1	
OR	Harney	Benson Pond	42.953050	-118.867690	3	
OR	Harney	Boca Lake	42.911840	-118.855170	1	
OR	Harney	Buck Taylor Ranch	43.264810	-118.896270	1	
OR	Harney	Burns Gravel Ponds	43.585430	-119.008380	1	
OR	Harney	Burns Sewage Ponds	43.568300	-119.068100	1	
OR	Harney	Cargill's Island	43.361390	-118.868400	1	
OR	Harney	Carlon Ranch	43.502900	-118.943360	2	Y
OR	Harney	Colby Marshall Ranch	43.381930	-119.383110	1	
OR	Harney	Cole Island Dike	43.363480	-118.720380	1	Y
OR	Harney	Culp Ranch	43.551980	-119.032510	1	
OR	Harney	Derrick Lake	43.298890	-119.320000	1	
OR	Harney	Diamond Craters	43.102900	-118.817740	1	
OR	Harney	Double-O Trees	43.258360	-119.236400	1	
OR	Harney	Drifttree #1	43.394120	-118.703510	1	
OR	Harney	Drifttree #2	43.360200	-118.673580	1	
OR	Harney	East Knox Pond	42.885710	-118.866460	1	
OR	Harney	Faye Lane	43.534510	-118.940520	2	
OR	Harney	Greasewood Island	43.379350	-118.837620	1	
OR	Harney	Highway 20 Mi. 146	43.612380	-118.794600	1	
OR	Harney	Hines Sewage Ponds	43.555230	-119.071730	1	
OR	Harney	Ibis Marsh	43.217970	-118.887560	1	
OR	Harney	Ibis Pond	43.209630	-118.905520	1	
OR	Harney	Krumbo Reservoir	42.945770	-118.798230	2	Y
OR	Harney	Krumbo Swamp	42.961400	-118.848800	2	
OR	Harney	Lawen Colony # 01	43.389600	-118.756240	1	
OR	Harney	Lawen Colony # 02	43.391750	-118.759560	1	
OR	Harney	Lawen Colony # 03	43.398470	-118.770710	1	
OR	Harney	Lawen Colony # 04	43.382440	-118.764260	1	
OR	Harney	Lawen Colony # 05	43.407770	-118.797120	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Harney	Lawen Colony # 06	43.411780	-118.791850	1	
OR	Harney	Lawen Colony # 09	43.379860	-118.833490	1	
OR	Harney	Lawen Colony # 11	43.433970	-118.823130	1	
OR	Harney	Lawen Colony # 12	43.430970	-118.780470	1	
OR	Harney	Lawen Colony # 16	43.395370	-118.854430	1	
OR	Harney	Lawen Colony # 18	43.426140	-118.803960	1	
OR	Harney	Lawen Colony # 19	43.396940	-118.804550	1	
OR	Harney	Lawen Colony # 22	43.399850	-118.854100	1	
OR	Harney	Lawen Colony # 23	43.406290	-118.853900	1	
OR	Harney	Lawen Colony # 24	43.389980	-118.819670	1	
OR	Harney	Lawen Rd Island	43.389670	-118.816640	1	
OR	Harney	Malheur Lake, Tern Island	43.356660	-118.771050	1	
OR	Harney	Mcwen Ranch	43.272560	-118.860550	2	Y
OR	Harney	MNWR, Crane Pond	42.979840	-118.861080	1	
OR	Harney	MNWR, Diamond Swamp	43.035230	-118.794960	1	Y
OR	Harney	MNWR, Dredger Field	42.924400	-118.870400	1	
OR	Harney	MNWR, Dredger Field West	42.943730	-118.878620	1	
OR	Harney	MNWR, Dredger Pond	42.924440	-118.870410	1	
OR	Harney	MNWR, E. Buena Vista Pond	43.063900	-118.853810	1	
OR	Harney	MNWR, Faye Field	42.889070	-118.892750	2	
OR	Harney	MNWR, Lava Beds Field	43.063680	-118.825360	1	
OR	Harney	MNWR, Retherford Lake	43.053140	-118.793690	1	
OR	Harney	MNWR, S. Meadow Field	42.858430	-118.900130	1	
OR	Harney	MNWR, W. Buena Vista Pond	43.064200	-118.861300	1	
OR	Harney	Moon Reservoir	43.408120	-119.397250	1	
OR	Harney	Mouth Of Blitzen River	43.290480	-118.834680	1	
OR	Harney	Mouth Of Silvies R. East	43.368680	-118.816990	1	
OR	Harney	Mouth Of Silvies R. West	43.372300	-118.831140	1	
OR	Harney	Mud Lake 1	43.279460	-119.005510	1	
OR	Harney	Mud Lake 2	43.273760	-119.004590	1	
OR	Harney	Mud Lake Islands	43.275600	-118.990200	1	
OR	Harney	Narrows Island	43.298220	-118.961190	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Harney	North Crump Lake	42.326350	-119.824460	1	Y
OR	Harney	North Malheur Lake	43.367590	-118.826520	1	
OR	Harney	Pelican Island	43.366380	-118.676560	1	
OR	Harney	Peterson	43.340200	-119.343800	1	
OR	Harney	Potter Swamp	43.501690	-119.081470	1	
OR	Harney	Rex Taylor Ranch	43.269980	-118.875390	2	
OR	Harney	Silver Creek	43.717410	-119.631980	1	
OR	Harney	Silvies Rookery	43.374110	-118.817620	1	Y
OR	Harney	Singhose Island	43.377650	-118.824550	5	Y
OR	Harney	Singhose South Island	43.370970	-118.828930	2	Y
OR	Harney	Sodhouse Marsh	43.255030	-118.884580	1	
OR	Harney	Sodhouse Ranch	43.256060	-118.871990	2	Y
OR	Harney	Sw Harney Lake	43.228650	-119.209160	1	
OR	Harney	Swan Lake Island	43.315530	-118.954540	1	
OR	Harney	Tanowama Marsh	43.260570	-119.231340	1	
OR	Harney	Three-Mile	42.488280	-118.910770	1	
OR	Harney	Upper Moon Reservoir	43.453780	-119.426510	1	
OR	Harney	Vicker's Lake	43.307730	-118.927140	1	
OR	Harney	Vogler Swamp	43.370400	-118.822000	1	
OR	Harney	Warbler Pond	43.303020	-119.306290	2	Y
OR	Harney	Warm Springs Reservoir	43.638810	-118.256600	1	
OR	Harney	West Knox Pond	42.890020	-118.879980	2	
OR	Harney	Wright's Pond	43.226000	-118.879700	1	
OR	Jackson	Howard Prairie	42.264300	-122.444980	1	
OR	Jackson	Hyatt Reservoir	42.186020	-122.455370	2	Y
OR	Jackson	Oak Knoll	42.470030	-122.839330	1	
OR	Jackson	Old Siskiyou	42.183480	-122.460820	1	Y
OR	Jackson	Tou Velle	42.440456	-122.930742	1	
OR	Jefferson	Trout Creek Campground	44.802992	-121.068989	1	
OR	Klamath	Adobe Flat	42.028940	-120.985070	1	
OR	Klamath	Agency Lake	42.537460	-121.967080	2	
OR	Klamath	Agency Lake Ranch	42.564240	-121.977610	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Klamath	Alkali Lake	42.206290	-121.474560	2	
OR	Klamath	Alkali Spring	42.043620	-121.006600	1	
OR	Klamath	Aspen Lake	42.275430	-122.012340	1	
OR	Klamath	Bear Valley	42.071350	-120.957200	2	
OR	Klamath	Big Adobe Reservoir	42.135090	-121.148240	1	
OR	Klamath	Bumphead Reservoir	42.060160	-121.106800	1	
OR	Klamath	Circle 5 Ranch	42.165500	-121.238330	1	
OR	Klamath	Devaul Lake	42.190960	-121.157000	1	
OR	Klamath	Devil Lake	42.316430	-120.959940	2	
OR	Klamath	Dog Hollow Reservoir	42.115480	-121.106920	1	
OR	Klamath	Eagle Ridge	42.388350	-121.965810	1	
OR	Klamath	East Of Beatty	42.440060	-121.198100	1	
OR	Klamath	East Of Ivory Pine	42.486140	-121.070320	1	
OR	Klamath	Gerber Reservoir	42.187610	-121.083050	1	
OR	Klamath	Gerber Reservoir Potholes	42.218370	-121.150570	1	
OR	Klamath	Goose Bay	42.471600	-121.941400	1	Y
OR	Klamath	Hank's Marsh	42.313140	-121.828650	2	Y
OR	Klamath	Haymaker Reservoir/ Harpold Reservoir	42.103340	-121.351970	2	
OR	Klamath	Historic Lower Klamath Lake	42.076220	-121.802290	1	
OR	Klamath	Historic Tule Lake	42.013080	-121.432770	1	
OR	Klamath	Hyde Reservoir	42.450390	-121.036780	1	
OR	Klamath	Kilgore Reservoir	42.059670	-121.044990	1	
OR	Klamath	Klamath River Marsh	42.139760	-121.852880	1	
OR	Klamath	Klamath River, Hwy 97	42.173680	-121.797660	1	Y
OR	Klamath	Lake Ewauna	42.219930	-121.786710	1	
OR	Klamath	Langell Valley Miscellaneous	42.049560	-121.213160	1	
OR	Klamath	Link River	42.228180	-121.798630	1	
OR	Klamath	Little Squaw Flat	42.213780	-120.949460	1	
OR	Klamath	Little Squaw Flat Reservoir	42.218410	-120.939880	1	
OR	Klamath	Long Lake	42.086550	-121.332070	1	
OR	Klamath	Lower Fishhole	42.241660	-120.917220	1	
OR	Klamath	Lower Klamath NWR East Area K	42.000120	-121.777850	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Klamath	Lower Klamath NWR West Area K	42.009980	-121.825570	1	
OR	Klamath	Lower Klamath NWR White Lake	41.999600	-121.629500	1	
OR	Klamath	Malone Dam	42.184940	-121.091520	1	
OR	Klamath	Middle Fishhole	42.220600	-120.895110	1	
OR	Klamath	Miller Island	42.148030	-121.837960	1	
OR	Klamath	Miller Island East	42.155150	-121.807540	1	
OR	Klamath	Miller Lake	42.023380	-121.877990	1	
OR	Klamath	Noble Reservoir	42.179110	-121.170990	1	
OR	Klamath	Nuss Lake	42.145110	-121.644520	1	
OR	Klamath	Round Lake	42.187220	-121.918130	2	
OR	Klamath	Round Valley Reservoir	42.139490	-121.072550	1	
OR	Klamath	Sherman Potter Reservoir	42.088620	-121.060120	1	
OR	Klamath	Shoalwater Bay	42.388770	-121.961340	1	
OR	Klamath	Spring Lake	42.094890	-121.738850	1	
OR	Klamath	Squaw Flat	42.219410	-120.969320	1	
OR	Klamath	Squaw Point Ponderosa	42.358890	-121.909960	2	Y
OR	Klamath	Swan Lake	42.327460	-121.597040	1	Y
OR	Klamath	Tingley Lake	42.122180	-121.778370	1	
OR	Klamath	Tingley Lake Estates	42.118470	-121.777870	1	
OR	Klamath	Upper Link River	42.238020	-121.806730	1	
OR	Klamath	Upper Midway Reservoir	42.115070	-121.025960	1	
OR	Klamath	Williamson River Delta Preserve	42.463640	-121.954780	2	
OR	Klamath	Willow Valley Reservoir	42.009290	-121.116150	1	
OR	Klamath	Wilson Reservoir	42.162950	-121.624840	1	
OR	Klamath	Wood River Wetlands	42.581400	-121.931460	1	
OR	Klamath	Yonna Valley Miscellaneous	42.262360	-121.486750	2	Y
OR	Lake	20 Mile Slough	42.139800	-119.837720	1	
OR	Lake	Albertson Pond #1	42.063960	-120.489990	1	Y
OR	Lake	Albertson Pond #2	42.064230	-120.493930	2	Y
OR	Lake	Albertson Pond #3	42.060300	-120.493420	1	
OR	Lake	Anderson Lake	42.501940	-119.830060	1	
OR	Lake	Bird Island Hart Lake	42.419320	-119.828710	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Lake	Bluejoint Lake Island	42.658470	-119.639650	1	
OR	Lake	Bullgate Refuge North	42.931470	-120.735770	1	
OR	Lake	Co. Rd. Field And Flats	42.963470	-120.736420	1	
OR	Lake	Dog Lake	42.084270	-120.704010	3	Y
OR	Lake	Dog Lake/Little Lakes	42.088879	-120.694397	1	
OR	Lake	Drews Reservoir	42.223920	-120.700260	1	
OR	Lake	Dutchy Lake And Potholes	42.966400	-120.770730	1	
OR	Lake	East Crump Lake	42.300970	-119.807140	1	
OR	Lake	East Of Plush	42.439260	-119.882300	1	Y
OR	Lake	East Tule Ponds	42.110550	-120.396170	2	Y
OR	Lake	Edmunds Well Wildlife Sanctuary	43.018930	-120.672460	1	
OR	Lake	Greaser Reservoir	42.158690	-119.812270	1	
OR	Lake	Guano Basin	42.224240	-119.504230	1	
OR	Lake	Gull Island	42.899990	-120.769130	1	
OR	Lake	Gull Islands Crump Lake	42.272930	-119.817780	1	
OR	Lake	Hart Lake	42.368230	-118.657380	1	
OR	Lake	Lake In The Dunes	43.032890	-120.663010	1	
OR	Lake	Lakeview Settling Ponds	42.184560	-120.362860	2	Y
OR	Lake	Lower Chewaucan	42.570830	-120.386110	1	
OR	Lake	Lynch Marsh	42.494260	-119.839590	1	Y
OR	Lake	Mc Meadows	42.153500	-119.907160	1	
OR	Lake	Mcfarland Marsh	42.080170	-120.473720	1	
OR	Lake	Paulina Marsh	43.174480	-121.027020	1	
OR	Lake	Pelican Lake Island, North	42.203200	-119.882230	1	Y
OR	Lake	Pelican Lake Island, South	42.202540	-119.883240	1	Y
OR	Lake	Perigo	42.967210	-120.747020	1	
OR	Lake	Rest Lake	42.958490	-120.754100	1	
OR	Lake	River's End Ranch	42.511710	-120.250210	1	Y
OR	Lake	Schoolhouse Tern Island	42.957420	-120.715610	1	Y
OR	Lake	Silver Lake	43.100120	-120.891820	1	
OR	Lake	SLWMA, Church Lake	42.970830	-120.769250	1	
OR	Lake	SLWMA, Link Marsh	42.952890	-120.721840	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Lake	SLWMA, Swan Pond	42.928610	-120.740550	1	Y
OR	Lake	South Of Gold Dike	42.905840	-120.781410	1	
OR	Lake	Stone Corral Lake	42.624450	-119.664010	1	
OR	Lake	Swamp Lake North	42.542270	-119.819800	2	Y
OR	Lake	Sycan Herons	42.863280	-121.096470	1	Y
OR	Lake	Sycan Marsh	42.800000	-121.100000	1	
OR	Lake	Thompson Reservoir	42.944980	-121.092040	1	
OR	Lake	Upper Chewaucan	42.708770	-120.517260	1	
OR	Lake	Warner Potholes	42.629050	-119.722090	1	
OR	Lake	Warner Wetlands	42.447020	-119.825480	1	
OR	Lake	West Crump Lake	42.300860	-119.866490	1	
OR	Lane	Alton Baker 2	44.058640	-123.078470	1	Y
OR	Lane	Coyote Creek North	44.041660	-123.267730	2	
OR	Lane	Delta Ponds	44.081590	-123.102840	1	
OR	Lane	Eugene	44.055700	-123.073140	1	
OR	Lane	Fern Ridge Reservoir	44.120560	-123.298330	5	Y
OR	Lane	Fisher Impoundment	44.065560	-123.269950	1	
OR	Lane	Long Tom River	44.062440	-123.354160	1	
OR	Lane	Mckenzie River	44.066442	-122.919306	1	Y
OR	Lane	Munsel Lake	44.007180	-124.087380	1	
OR	Lane	Warren Slough	44.049840	-123.281790	1	
OR	Lane	West Coyote Unit	44.047410	-123.284860	1	Y
OR	Lane	Willamette River GBHE 1	44.145760	-123.127190	1	
OR	Lane	Willamette River GBHE 2	44.178960	-123.129860	1	
OR	Lane	Willamette River GBHE 3	44.230750	-123.156090	1	Y
OR	Lincoln	Heceta Head	44.125690	-124.125850	1	Y
OR	Linn	Sam Daws Ne	44.413700	-123.224850	1	
OR	Malheur	Batch Lake	43.074170	-117.373060	2	
OR	Malheur	Copeland Reservoir	43.425910	-117.738930	2	
OR	Malheur	Cow Lake	43.074720	-117.349720	2	
OR	Marion	Browns Island	44.923610	-123.080000	1	
OR	Marion	Willamette River GBHE 11	44.861542	-123.163202	1	

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State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Marion	Willamette River GBHE 12	44.885329	-123.138867	1	Y
OR	Marion	Willamette River GBHE 13	44.922019	-123.108779	1	
OR	Marion	Willamette River GBHE 14	44.963732	-123.037465	1	Y
OR	Marion	Willamette River GBHE 15	45.047067	-123.066954	1	
OR	Morrow	Threemile Canyon Island	45.816690	-119.965560	1	Y
OR	Morrow	Umatilla NWR	45.894330	-119.605170	1	Y
OR	Multnomah	Bartlet East	45.573470	-122.479260	1	Y
OR	Multnomah	Bartlet West	45.573930	-122.483530	1	
OR	Multnomah	Heron Lakes Golf Course	45.609594	-122.704147	1	Y
OR	Multnomah	Mcguire 1	45.562720	-122.452080	1	Y
OR	Multnomah	Metro Property	45.487428	-122.381875	1	
OR	Multnomah	Multnomah Channel	45.653867	-122.843822	1	
OR	Multnomah	Multnomah Channel - East Bank Near Rocky Pt	45.667270	-122.855940	1	
OR	Multnomah	Multnomah Channel - Nw Rafton Rd	45.640290	-122.824600	1	
OR	Multnomah	Multnomah Channel - West Bank	45.665600	-122.858520	1	
OR	Multnomah	Multnomah Channel 20 A	45.648300	-122.830350	1	
OR	Multnomah	Multnomah Houseboats	45.648150	-122.828390	1	
OR	Multnomah	Multnomah New	45.660240	-122.851620	1	Y
OR	Multnomah	Reed Island-Multnomah	45.502917	-122.308547	1	
OR	Multnomah	Ross Island	45.497506	-122.664081	1	Y
OR	Multnomah	Ross Island Upriver	45.475590	-122.667900	1	
OR	Multnomah	Sauvie Island	45.691869	-122.806664	1	Y
OR	Multnomah	Sauvie Island 3	45.718633	-122.775989	1	Y
OR	Multnomah	Smith And Bybee Lakes	45.622860	-122.746130	1	Y
OR	Multnomah	Tomahawk Island	45.604333	-122.650931	1	
OR	Multnomah	Tri-Club Island	45.593925	-122.554389	1	Y
OR	Polk	Willamette River GBHE 10	44.848242	-123.178707	1	Y
OR	Polk	Willamette River GBHE 8	44.757862	-123.147445	1	
OR	Polk	Willamette River GBHE 9	44.792899	-123.122688	1	
OR	Union	Ladd Marsh WMA	45.262890	-118.033800	1	
OR	Union	Ladd Marsh WMA 2	45.269050	-117.951130	1	
OR	Washington	Dawson Creek Corporate Park	45.540339	-122.934511	1	

KBO 2011 colonial waterbird summary

State	County	Site Name	Latitude	Longitude	# Visits	Colony
OR	Washington	Hillsboro Main Library	45.541840	-122.933450	1	Y
OR	Washington	Jackson Bottom Wetland--Owl Woods	45.500675	-122.973694	1	Y
OR	Washington	Koll Center Wetlands	45.456300	-122.789042	1	
OR	Washington	Koll Center Wetlands, Creekside Marsh, Fanno Creek	45.454775	-122.791200	1	
OR	Washington	Rock Creek, Norm Thompson	45.546650	-122.885075	1	Y
OR	Washington	Tigard, City Hall	45.424706	-122.766658	1	
WA	Clark	Ione Reef	45.568370	-122.413470	1	Y
WA	Clark	Pov Buckmire Slough Parcel 4 (WDFW Ref Arhe 403-1)	45.677697	-122.765358	1	
WA	Clark	Pov Vancouver Lake West	45.686578	-122.755189	1	
WA	Clark	Pov, Rufener Parcel 6 North / WDFW	45.654917	-122.715000	1	
WA	Clark	Pov, Rufener Parcel 6 South / WDFW	45.654000	-122.715556	1	
WA	Clark	Reed Island WA	45.553900	-122.321070	1	Y
WA	Clark	Shillapoo South	45.678175	-122.747250	1	

Table 2. Number of breeding pairs counted at tree and ground-nesting waterbird colonies by Klamath Bird Observatory in 2011, by site and species. In a given colony, the number of breeding pairs was determined by the number of nests or one-half the number of adults when a nest count was not possible. If less than 100% of a colony was surveyed, the number of nests and adults were extrapolated to estimate the size of the entire colony.

State	County	Site Name	American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unidentified Gull	Caspian Tern ¹
OR	Benton	Willamette 16			30							
OR	Benton	Willamette River GBHE 4			34							
OR	Benton	Willamette River GBHE 6			5							
OR	Clackamas	Goat Island			4							
OR	Clackamas	Oak Grove Neighborhood			16							
OR	Columbia	Sauvie Island 2			15							
OR	Coos	Coos River Hwy		40		115						
OR	Coos	North Point		160								
OR	Coos	Sunset Bay		28							30	
OR	Crook	Crook County 2			2							
OR	Crook	Prineville 1			16							
OR	Crook	Prineville 2			26							
OR	Deschutes	Crane Prairie Reservoir		20								
OR	Douglas	Bolon Island		390								
OR	Harney	Carlton Ranch		11	16	76	3	20				
OR	Harney	Cole Island Dike			3							

State	County	Site Name	American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unidentified Gull	Caspian Tern ¹
OR	Harney	Krumbo Reservoir			1							
OR	Harney	Mcewen Ranch								15		
OR	Harney	MNWR, Diamond Swamp				8						
OR	Harney	North Crump Lake			2	5		3				
OR	Harney	Silvies Rookery				16		8				
OR	Harney	Singhose Island	200						130	64		48
OR	Harney	Singhose South Island	200	13								
OR	Harney	Sodhouse Ranch		15	20							
OR	Harney	Warbler Pond						37	38			
OR	Jackson	Hyatt Reservoir		14								
OR	Jackson	Old Siskiyou			8							
OR	Klamath	Goose Bay										
OR	Klamath	Hank's Marsh						24				
OR	Klamath	Klamath River, Hwy 97						4				
OR	Klamath	Squaw Point Ponderosa			9							
OR	Klamath	Swan Lake							256			
OR	Klamath	Yonna Valley Miscellaneous	29									
OR	Lake	Albertson Pond #1							4			
OR	Lake	Albertson Pond #2							25			
OR	Lake	Dog Lake							1			
OR	Lake	East Of Plush							50			
OR	Lake	East Tule Ponds				32		7				

State	County	Site Name	American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unidentified Gull	Caspian Tern ¹
OR	Lake	Lakeview Settling Ponds							209			
OR	Lake	Lynch Marsh						4				
OR	Lake	Pelican Lake Island, North	108			3				58		
OR	Lake	Pelican Lake Island, South	108	8	17	23				167		
OR	Lake	River's End Ranch		11		11						
OR	Lake	Schoolhouse Tern Island		6					700			
OR	Lake	SLWMA, Swan Pond						4				
OR	Lake	Swamp Lake North							5			
OR	Lake	Sycan Herons			9							
OR	Lane	Alton Baker 2			3							
OR	Lane	Fern Ridge Reservoir										
OR	Lane	Mckenzie River			12							
OR	Lane	West Coyote Unit			5							
OR	Lane	Willamette River GBHE 3			14							
OR	Lincoln	Heceta Head										
OR	Marion	Willamette River GBHE 12			4							
OR	Marion	Willamette River GBHE 14			3							
OR	Morrow	Threemile Canyon Island		3						916		
OR	Morrow	Umatilla NWR			2	9						
OR	Multnomah	Bartlet East			14							
OR	Multnomah	Heron Lakes Golf Course			21							
OR	Multnomah	Mcguire 1			9							

State	County	Site Name	American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unidentified Gull	Caspian Tern ¹
OR	Multnomah	Multnomah New			8							
OR	Multnomah	Ross Island			5							
OR	Multnomah	Sauvie Island			2							
OR	Multnomah	Sauvie Island 3			23							
OR	Multnomah	Smith And Bybee Lakes			19	6						
OR	Multnomah	Tri-Club Island			14							
OR	Polk	Willamette River GBHE 10			3							
OR	Washington	Hillsboro Main Library			1							
OR	Washington	Jackson Bottom Wetland--Owl Woods			15							
OR	Washington	Rock Creek, Norm Thompson			10							
WA	Clark	Ione Reef		27								
WA	Clark	Reed Island WA			40							

¹ American White Pelican and Caspian Tern data presented here were collected by Klamath Bird Observatory and do not include colonies surveyed by Oregon State University in 2011.

Table 3. Number of colonies, adults, nests, and breeding pairs of tree and ground-nesting waterbirds counted in 2011, summarized by species and county. Only counties where surveys were completed are included. In a given colony, the number of breeding pairs was determined by the number of nests or one-half the number of adults when a nest count was not possible. If less than 100% of a colony was surveyed, the number of nests and adults were extrapolated to estimate the size of the entire colony.

State	County		American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unknown Gull	Caspian Tern ¹
Oregon	Baker	# Colonies										
		# Adults										
		# Nests										
		# Breeding Pairs										
Oregon	Benton	# Colonies			3							
		# Adults			1							
		# Nests			69							
		# Breeding Pairs			69							
Oregon	Clackamas	# Colonies			2							
		# Adults							1		12	
		# Nests			20							
		# Breeding Pairs			20							
Oregon	Columbia	# Colonies			1							
		# Adults			4							
		# Nests			15							
		# Breeding Pairs			15							

State	County		American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unknown Gull	Caspian Tern ¹
Oregon	Coos	# Colonies		3		1					1	
		# Adults		6	4	20					1	
		# Nests		228		115					30	
		# Breeding Pairs		228		115					30	
Oregon	Crook	# Colonies			3							
		# Adults		2								
		# Nests			44							
		# Breeding Pairs			44							
Oregon	Curry	# Colonies										
		# Adults		3				12				
		# Nests										
		# Breeding Pairs										
Oregon	Deschutes	# Colonies		1								
		# Adults	115	147	15				6	5		3
		# Nests		20								
		# Breeding Pairs		20								
Oregon	Douglas	# Colonies		1								
		# Adults										
		# Nests		390								
		# Breeding Pairs		390								

State	County		American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unknown Gull	Caspian Tern ¹
Oregon	Harney	# Colonies	2	3	5	4	1	4	2	2		1
		# Adults	1511	179	21	73	9	36	459	193	321	122
		# Nests		19	39	97	3	60				
		# Breeding Pairs	400	39	42	105	3	68	167	79		48
Oregon	Jackson	# Colonies		1	1							
		# Adults	37	16	2				4			20
		# Nests		14	8							
		# Breeding Pairs		14	8							
Oregon	Jefferson	# Colonies										
		# Adults										
		# Nests										
		# Breeding Pairs										
Oregon	Klamath	# Colonies	1		1			2	1			
		# Adults	270	369	24	113	12	65	685	157	101	121
		# Nests	29		9							
		# Breeding Pairs	29		9			28	256			
Oregon	Lake	# Colonies	2	3	2	4		3	7	2		
		# Adults	658	110	66	72		41	2403	733	33	32
		# Nests		11	9	43		5	239			
		# Breeding Pairs	217	25	26	70		15	994	225		

State	County		American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unknown Gull	Caspian Tern ¹
Oregon	Lane	# Colonies			4							
		# Adults	37	2	11							
		# Nests			35							
		# Breeding Pairs			34							
Oregon	Lincoln	# Colonies										
		# Adults										
		# Nests										
		# Breeding Pairs										
Oregon	Linn	# Colonies										
		# Adults										
		# Nests										
		# Breeding Pairs										
Oregon	Malheur	# Colonies										
		# Adults	63	11	1					1		6
		# Nests										
		# Breeding Pairs										
Oregon	Marion	# Colonies			2							
		# Adults										
		# Nests			7							
		# Breeding Pairs			7							

State	County		American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unknown Gull	Caspian Tern ¹
Oregon	Morrow	# Colonies		1	1	1				1		
		# Adults	25	1								4
		# Nests		3	2	9				916		
		# Breeding Pairs		3	2	9				916		
Oregon	Multnomah	# Colonies			9	1						
		# Adults		3	5						2	
		# Nests			115	6						
		# Breeding Pairs			115	6						
Oregon	Polk	# Colonies			1							
		# Adults										
		# Nests			3							
		# Breeding Pairs			3							
Oregon	Union	# Colonies										
		# Adults		3	1	1		2	1			
		# Nests										
		# Breeding Pairs										
Oregon	Washington	# Colonies			3							
		# Adults			3							
		# Nests			26							
		# Breeding Pairs			26							

State	County		American White Pelican ¹	Double-crested Cormorant	Great Blue Heron	Great Egret	Snowy Egret	Black-crowned Night Heron	Ring-billed Gull	California Gull	Unknown Gull	Caspian Tern ¹
Washington	Clark	# Colonies		1	1							
		# Adults			11	1						
		# Nests		27	40							
		# Breeding Pairs		27	40							
Totals		# Colonies	5	14	39	11	1	9	10	5	1	1
		# Adults	2716	851	169	280	21	156	3558	1089	470	308
		# Nests	29	712	441	270	3	65	239	916	30	
		# Breeding Pairs	646	747	459	305	3	111	1417	1220	30	48

¹American White Pelican and Caspian Tern data presented here were collected by Klamath Bird Observatory and do not include colonies surveyed by Oregon State University in 2011.

Table 4. Number of colonies, adults, nests, and breeding pairs of marsh-nesting waterbirds counted in 2011, summarized by species and site. All sites where surveys were completed are included in this table. In a given colony, the number of breeding pairs was determined by the number of nests or one-half the number of adults when a nest count was not possible. If less than 100% of a colony was surveyed, the number of nests and adults were extrapolated to estimate the size of the entire colony.

				Eared Grebe	Western Grebe	Clark's Grebe	Unknown Western/Clark's Grebe	Black Tern
State	County	Site Name						
Oregon	Klamath	Goose Bay	# Colonies	1	1			
			# Adults					
			# Nests	12	4			
			# Breeding Pairs	12	4			
Oregon	Lane	Fern Ridge Reservoir	# Colonies		1	1	1	1
			# Adults		120	35	53	18
			# Nests		5	1	4	25
			# Breeding Pairs		64	18	30	25
Totals			# Colonies	1	2	1	1	1
			# Adults		120	35	53	18
			# Nests	12	9	1	4	25
			# Breeding Pairs	12	68	18	30	25

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